

# MARINE RECREATIONAL INFORMATION PROGRAM

**FY Project Plan**

**Finding Nemo's Finder: A new approach to Saltwater Fishing Participation Estimation**

**Created on**

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# 1. Overview

## 1.1. Background

The Marine Recreational Fisheries Statistics Survey (MRFSS) estimator of the number of anglers participating in marine recreational fishing is based on the Coastal Household Telephone Survey (CHTS) estimator of total fishing effort and a secondary Access Point Angler Intercept Survey (APAIS) estimator of mean angler avidity. The number of participants is estimated by dividing the APAIS estimate of mean avidity (mean number of fishing days per angler) into the MRFSS estimate of total fishing effort (total number of angler fishing days).

The NRC Report stressed the importance of testing the various assumptions that are made in the current estimation procedures used for the MRFSS and the other current recreational fishery surveys. The Report concluded that “unknown biases in the estimators from these surveys arise from reliance on unverified assumptions. Unless these assumptions are tested and the degree and direction of bias reliably estimated, the extent to which the biases affect final estimates will remain unknown.” The NRC Report also stated that “it is impossible to assess the adequacy of recreational fishing surveys, particularly those associated with the MRFSS, when potential biases exist. Identifying and eliminating the sources of bias or estimating and correcting for the degree of bias is a fundamental requirement for the provision of reliable estimates from the MRFSS.”

Developing reliable, unbiased estimators of the total numbers of marine recreational fishing participants in each state will greatly improve our assessments of the fishing community, as well as our assessments of the possible economic and sociocultural impacts that changes in fishing regulations may have. A project team has been established to 1) to evaluate possible sources of bias in the current MRFSS estimator of participation and 2) develop an improved survey design and estimation method for monitoring changes in marine recreational fishing participation.

A Project Team consisting of expert consultants and representatives from the NOAA Fisheries Service, the U.S. Fish & Wildlife Service, the U.S. Census Bureau, and the Georgia Department of Natural Resources has been working together to evaluate potential sources of bias in the current MRFSS estimator of participation and to develop improved sampling and estimation methods for use in future surveys of participation. The Team is currently working on applying the new improved estimation methods for the current MRFSS APAIS to produce revised estimates of participation that could be compared with past MRFSS estimates to look for evidence of any consistent directional bias. The Team has also been evaluating a wide variety of alternative survey designs that could potentially provide more accurate participation estimates in future years.

A major concern with collecting this type of data is that adults are relatively poor respondents in placing their fishing activities in time, especially if the recall period is as long as one year (Chu et al. 1989, Chu et al. 1992), and a recall period that is considerably shorter than one year is believed to be more accurate. Because of this potential response error, many surveys that face

this problem ask respondents to report about shorter recall periods, but go back to the same respondents repeatedly in a panel design. For example, the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR) interviews respondents up to three times over a year to get annual estimates of fishing participation and effort. The repeated contacts at 4-month intervals reduce the potential errors in placing events in time, but require greater effort because multiple data collection efforts must be fielded with greater costs.

To enable us to better understand the measurement errors associated with reporting participation and the number of trips, we propose a study to test a new design for participation estimation that consists of two complementary surveys. The overall approach for this methodological investigation involves conducting a longitudinal survey, or panel survey, in conjunction with a series of independent cross-sectional surveys. The cross-sectional approach can be accomplished by simply adding three very simple questions to planned MRIP dual-frame surveys of marine recreational fishing effort. The intention is to explore the possibility of conducting cross-sectional surveys to estimate participation rates that are relatively inexpensive yet have good or consistent recall properties. If we found that the over-reporting of participation was minimal in the cross-sectional surveys and the avidity bias adjustment factors derived from the cross-sectional surveys are reasonable, then it might be feasible to drop the longitudinal survey or only do it periodically. Or, it is also possible that the errors in the cross-sectional survey are large enough that adjustments of the nature described above are insufficient to produce estimates with the desired accuracy. In this case, the cross-sectional surveys might have to be abandoned and a longitudinal survey of a large size would be needed, at least periodically.

## **1.2. Project Description**

The planned dual-frame surveys of fishing effort will be conducted bimonthly in each state to independently sample households using both a complete list of mailing addresses (U.S. Post Office Delivery Sequence File) and a list of license holder mailing addresses. An adult will be interviewed in the sampled households and asked about saltwater fishing in each of three progressively longer time periods during the past year -- the past 4 months, the past 8 months, and the past 12 months. The data obtained will be used to produce estimates of the number of participants in each period, with the annual (12-month) participation rates being of prime interest. Because the participation data obtained in any given survey for the three different time frames will be overlapping with data obtained in succeeding bimonthly surveys, it will be possible to compare response data based on different lengths of recall for the same time period. This creates the "cross-sectional" design that will facilitate evaluation of possible recall biases.

Therefore, we will be able to collect cross-sectional data for the same 4-month time period that is based on different recall periods by simply adding items to the currently proposed series of single-phase, dual-frame surveys for estimating fishing effort. The effort surveys are scheduled to be conducted a total of 6 times, with an independent sample selected every 2 months, beginning in Wave 5 (November-December 2012). The additional data items on participation will be included in

each of these 6 data collection waves. The greater frequency of the cross-sectional surveys (every 2 months instead of every 4 months as in the FHWAR) is not a problem; in fact it should provide even more information for examining recall errors on saltwater fishing participation.

As discussed earlier, the longitudinal survey is intended primarily to produce a reliable annual estimate of the number and percent of adults who participated in saltwater recreation in the last year that can be used to assess the magnitude of recall bias in the cross-sectional surveys and possibly to adjust for that bias. The longitudinal survey will sample households and interview adults in the sampled households three times over the year. To contain costs, the planned longitudinal survey will be done by mail and will be self-administered. Like the cross-sectional surveys, the sample will use the ABS and license frame for selecting the units. The first mail questionnaire will have questions that determine saltwater fishing status of all adults in the household for the previous 4 months, the total number of saltwater trips they took during that period by mode (shore or boat). The instrument will also have questions that can be used to classify the adults into one of 3 categories of anglers: current – have participated in the last 4 months; likely – have not participated in the last 4 months, but have in the last 12 months or are likely to do so in the next 12 months; and, unlikely – have not participated and unlikely to participate in the next 12 months. Following the initial survey, we plan to survey the current and likely participants two more times at 4 month intervals and include questions about trips they took since the previous interview (those that do not respond in the second wave will be asked about trips in the past 8 months in the year-end survey). The unlikely participants will be subsampled and also be included on the same schedule of interviewing at each 4 month period.

The longitudinal survey estimates can be compared to the cross-sectional survey estimates to explore the differences in the estimates due to the different designs, especially differences due to different recall periods. To this end, the longitudinal survey will be conducted concurrently with three of the waves of the cross-sectional survey. A number of different estimation methods will be evaluated to assess the effect of the recall bias on the annual participation estimates. In particular, we will compare methods that directly target the recall bias for trips taken more than 4 months and more than 8 months ago, with methods that correct for “double-counting” which occurs when adding up multiple cross-sectional 4-month participation estimates to produce annual participation estimates. Based on this evaluation, we intend to propose an estimation method that can be used to estimate annual participation based on suitably adjusted estimates from the cross-sectional survey estimates.

### **1.3. Objectives**

The primary objective of this effort is to develop a sample design that can produce accurate estimates of annual participation in saltwater fishing by adults in a cost efficient way. With this pilot study, we particularly seek to assess whether repeated cross-sectional samples can achieve the same level of precision and accuracy for estimating annual saltwater fishing participation. We also plan to compare the estimates generated from this study with the estimates based on the

traditional MRFSS approach to help with the evaluation of potential bias.

#### **1.4. References**

Chu, A., Eisenhower, D., Morgenstein, D., and Waksberg, J. (1989). "Investigation of Possible Recall/Reference Period Bias in National Surveys of Fishing, Hunting and Wildlife-Associated Recreation." 269 pp.

Chu, A., Eisenhower, D., Hay, M.,  
Morganstein, D., Neter, J., and Waksberg, J. (1992). Measuring the recall error in self-reported fishing and hunting activities, *Journal of Official Statistics*, 8, 19-39.

## **2. Methodology**

### **2.1. Methodology**

Panel survey

### **2.2. Regions**

### **2.3. Geographic Coverage**

TBD (The team is planning to cover 1-4 states where dual-frame effort surveys will be conducted)

### **2.4. Temporal Coverage**

One year (The team is evaluating the best starting date, will be no earlier than Wave 5, 2012)

### **2.5. Frequency**

One panel with 3 survey interviews, 4 months apart

### **2.6. Unit of Analysis**

angler, participation and mean avidity estimates

### **2.7. Collection Mode**

mail

### **3. Communications Plan**

#### **3.1. Internal**

Monthly conference call meeting and posting material to MRIP Collaboration Tool or distributing by email as necessary

#### **3.2. External**

Monthly progress report to the MRIP Operations Team

## **4. Assumptions and Constraints**

### **4.1. New Data**

Yes

### **4.2. Track Costs**

### **4.3. Funding Vehicle**

New contract needed

### **4.4. Data Resources**

None

### **4.5. Other Resources**

Consultants (Mike Brick, Jean Opsomer)

### **4.6. Regulations**

None

### **4.7. Other**

Results from cross-sectional study for comparison (Cross-sectional data will be collected by adding items to the currently proposed series of single-phase, dual-frame surveys for estimating fishing effort).



# 5. Risk

## 5.1. Project Risk

Table 1: Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach
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## **6. Final Deliverables**

### **6.1. Additional Reports**

None

### **6.2. New Data Sets**

Response errors for 12-month recall of participation

### **6.3. New Systems**

None

# 7. Project Leadership

## 7.1. Project Leader and Members

Table 2: Project Members

Project Role	Name	Organization	Title
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## 8. Project Estimates

### 8.1. Project Schedule

Table 3: Project Schedule - Major Tasks and Milestones

#	Schedule Description	Planned Start	Planned Finish	Prerequisites	Milestones
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### 8.2. Cost Estimates

Table 4: Cost Estimates

Project Need	Cost Description	Date Needed	Estimated Cost
TOTAL			\$0.00